# Cost Effectiveness and Cost Benefit Analysis of Family Planning in Kenya

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## Background

The Government of Kenya is committed to universal health coverage (UHC) and accelerated achievement of the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) outcomes. Family planning (FP) is a central pillar of Kenya's reproductive health (RH) programme and the wider national health priorities as outlined in the Kenya Health Sector Strategic & Investment Plan (KHSSP) 2013-17, Kenya Vision 2030 and Kenya Health Sector Policy. The central role of FP is also emphasized in Sessional Paper No. 3 of 2012 on Population Policy for National Development (Republic of Kenya, 2012). The Policy identifies rapid population growth and a youthful population structure as key issues that if poorly managed pose challenges in the realization of Vision 2030. Kenya's population trends reveal a gradual increase in population size. In 2009, Kenya's population size was 38.6 million, with 2016 figures showing a population of 46 million, and 2020 projections indicating 52.2 million. Kenya's largest population proportion is youthful, with over half (53.5%) ranging 0-24 years.

## Main question/ Hypothesis

Kenya aims at achieving Universal Health Coverage and it is therefore imperative to rope in both public and private sector players into investing in family planning provision and financing. This would require estimates for cost effectiveness and cost benefit ratios to inform returns into investments in family planning. Global evidence reveals that investing in RMNCAH is a smart buy, since for an additional **US$1** invested in women's and children's health, there would be **US$9** of economic and social benefits. It further reveals that investing in women is a smart investment that improves productivity, engenders economic empowerment, closes the gender gap and has an inter-generational impact.

## Methodology

The costing analysis applied the Costed Implementation Plan (CIP) Costing Tool developed by Health Policy Plus (HPP) that utilizes the activity-based approach to cost FP services in Kenya. Three data inputs were used: i) population in need of FP services; ii) coverage targets; and iii) unit costs. The unit costs were computed using the ingredients approach. Cost per Disability Adjusted Life Years (DALY) averted was estimated using the results from the ImpactNow model. Cost benefit analysis (CBA) involved measuring and comparing costs and benefits of various interventions, revealing their relative efficiency. Since cost benefit analysis requires that the benefits are monetized, maternal and child deaths averted were converted into productivity losses in terms of GDP per capita. In addition, life expectancy was used to estimate the number of years that one death averted was deemed productive.

## Results

The average cost effectiveness ratio (ACER) is estimated to be US$ 24.8 for 2017, and it increases to US$ 26.8 for 2018, decreasing to US$ 25.6 and US$ 25.1 in 2019 and 2020 respectively. The implication of the Cost per DALY Averted for 2017 means that a US$ 24.8 investment in family planning will help avert one disability arising from maternal and child

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deaths (DALYs Averted). This increases to 26.8 Cost per DALY Averted in 2018, and this is mainly because the costs in 2017 were higher attributed to increased demand creation costs of FP. This reveals that in Kenya, Family Planning is highly cost effective, given that the Average cost effectiveness ratios are more than three times lower than the GDP per Capita US$ 1,455.36[3].

The Benefit Cost Ratio (BCR) is estimated to be US$ 9.2 for 2017, and it decreases to US$ 8.6 in 2018, increasing to US$ 9.2 and US$ 9.5 in 2019 and 2020 respectively. The implication of the estimated Benefit Cost Ratio that is greater than one (BCR>1) implies that investment in FP will yield discounted benefits that are greater than discounted costs, and therefore the investment should go ahead. The returns from investing in FP are very high since for 2017, a US$ 1 investment in FP yields US$9.2 in benefits.

**Knowledge Contribution**

The study established that FP is highly cost effective in Kenya, given that the Average cost effectiveness ratios are much lower than the GDP per Capita US$ 1,455.36. It further establishes that the Benefit Cost Ratio that is greater than one (BCR>1), which implies that investment in FP will yield discounted benefits that are greater than discounted costs, and therefore the investment should go ahead. The findings of the study point at the need to encourage actors in both public and private sectors to provide FP services since the economic returns are positive (CBA and CEA). Arising from these findings, the following should be done:

i. Establishment of an engagement framework, including a convening platform, which allows for cross-sector discussion and collaboration to inform expansion of FP initiatives within the private for-profit sector
ii. Establish or modify regulations and guidelines, as necessary to facilitate high quality private sector FP service provision
iii. Address affordability of FP services in the private for-profit sector by standardising the service and exploring innovative approaches that will reduce OOP expenditures, such as using medical/ health insurance.
iv. Identify high-need areas that is prime for private sector expansion, so that public resources can be dedicated towards geographical areas/ population segments that are more in need/ do not have the ability to pay

[3] Thresholds for the cost–effectiveness of interventions: alternative approaches (http://www.who.int/bulletin/volumes/93/2/14-138206/en/)

## 1.0 INTRODUCTION

The Government of Kenya is committed to universal health coverage (UHC) and accelerated achievement of the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) outcomes. Family planning (FP) is a central pillar of Kenya's reproductive health (RH) programme and the wider national health priorities as outlined in the Kenya Health Sector Strategic & Investment Plan (KHSSP) 2013-17, Kenya Vision 2030 and Kenya Health Sector Policy. The central role of FP is also emphasized in Sessional Paper No. 3 of 2012 on Population Policy for National Development (Republic of Kenya, 2012). The Policy identifies rapid population growth and a youthful population structure as key issues that if poorly managed pose challenges in the realization of Vision 2030.

Kenya's population trends reveal a gradual increase in population size. In 2009, Kenya's population size was 38.6 million, with 2016 figures showing a population of 46 million, and 2020 projections indicating 52.2 million[4]. Kenya's largest population proportion is youthful, with over half (53.5%) ranging 0-24 years[5]. Despite the gradual increase in population size, the country's Total Fertility Rates (TFR) has been improving since year 2003 as shown in Figure 1.1.

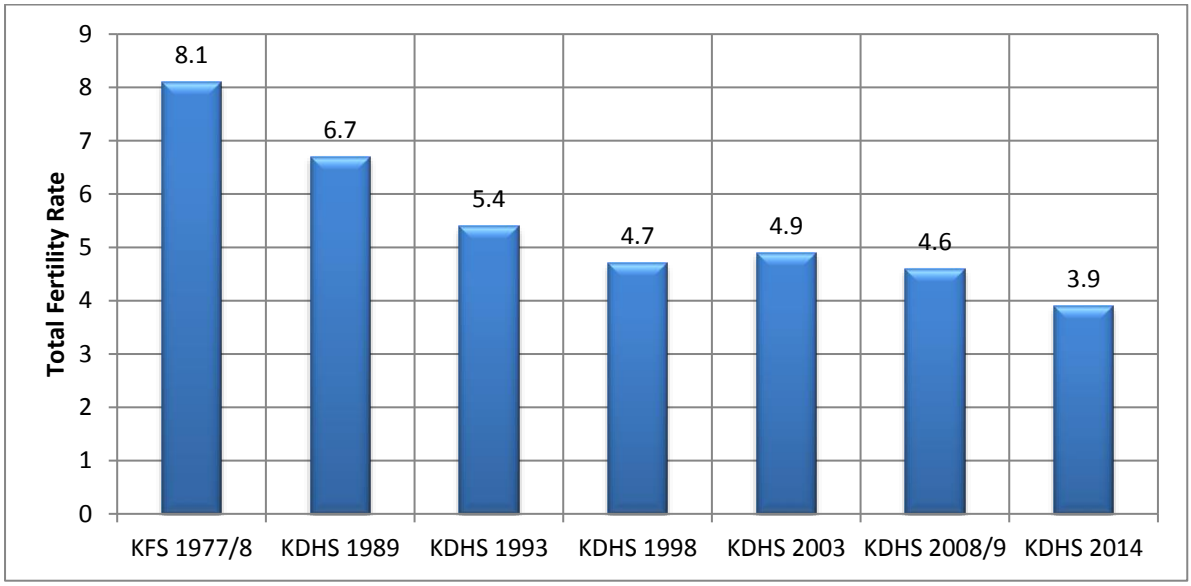



**Figure 1.2: Trends in fertility in Kenya**

Kenya has made credible progress in improving its contraceptive prevalence rate (CPR) and reduction of unmet need for FP. These two factors have led to the reduction in the TFR. There has also been an increase in uptake of long acting methods from 9% in 2008/9 to 25% in 2014 (KDHS). Despite the overall progress in TFR and CPR, there are disparities among different counties, and specific population groups such as adolescents, and among women in poor backgrounds and hard to reach areas. For instance, the contraceptive prevalence rate (CPR) in

[4] Kenya National Bureau of Statistics (KNBS). 2009

5 2016 population pyramid estimations

central Kenya is 73% while North Eastern is at 3.4% (KDHS, 2014). In addition, disparities in FP utilization rates are still visible among different regions, and specific population groups such as adolescents, the poor and marginalized women[6.]

The Government of Kenya's FP2020 target is to increase modern contraceptive prevalence rate (mCPR) from 56 percent in 2015, to 58 percent in 2020 and 70 percent by 2030. FP2020 priorities identified in 2016 were to increase political commitment and domestic financing for family planning. These priorities remain critical in 2017 and beyond as Kenya face a significant shortfall in financing for family planning programs and commodities. In addition, transition to devolved system of governance and specifically the devolution of health services with related challenges have also contributed to challenges of financing of FP programs and commodities which all need to be taken into consideration if Kenya is to meet her targets and international obligation including FP2020 goal. The country need to broaden the reach, scope and strategic focus of FP programing.

There is growing evidence that investing in women, children and adolescents has high returns to society and the economy by saving lives, reducing morbidity and mortality, and improving wellbeing (Bhutta et al., 2013, NCPD and PRB, 2012). With Kenya reported to have made good progress over the recent decades in reducing the number of child deaths, many mothers and children continue to die each year despite the availability of feasible, cost effective and evidence based solutions that could be scaled up. For instance, increasing the coverage of family planning could dramatically reduce unintended pregnancies and unsafe abortions.

The National Council for Population and Development (NCPD) in 2015, using the impact model estimated that with an increased use of FP services, it is possible to reach a Contraceptive Prevalence Rate (CPR) of 64.7 percent by 2020, leading to more lives being saved, specifically, 20,000 mothers and 144,000 children, and avert more than 7.7 million unintended pregnancies and 1.4 million unsafe abortions.

## 1.2 Family Planning Provision and Financing

Financing of family planning commodities and activities in Kenya, is currently reliant on three main sources:

(i) Public
(ii) Private
(iii) External support (donors)

The Family Planning draft Costed Implementation Plan (2017) presents the available resources by government (national & county), development partners and others for the period 2017 and 2020. The proportions for the overall period reveal heavy reliance on development partners in the financing of FP. However, the county governments have committed to provide 24 percent of the required resources, though this indirect through human resources and operations and maintenance.

[6] For example the CPR in some counties of central Kenya is 73% where as in some counties of Northern region it is as low as 3.4%; the percentage of women who have begun childbearing increases rapidly with age, from about 3% among women age 15 to 40% among women age 19 an unacceptably high fertility rate among the youth and adolescents.

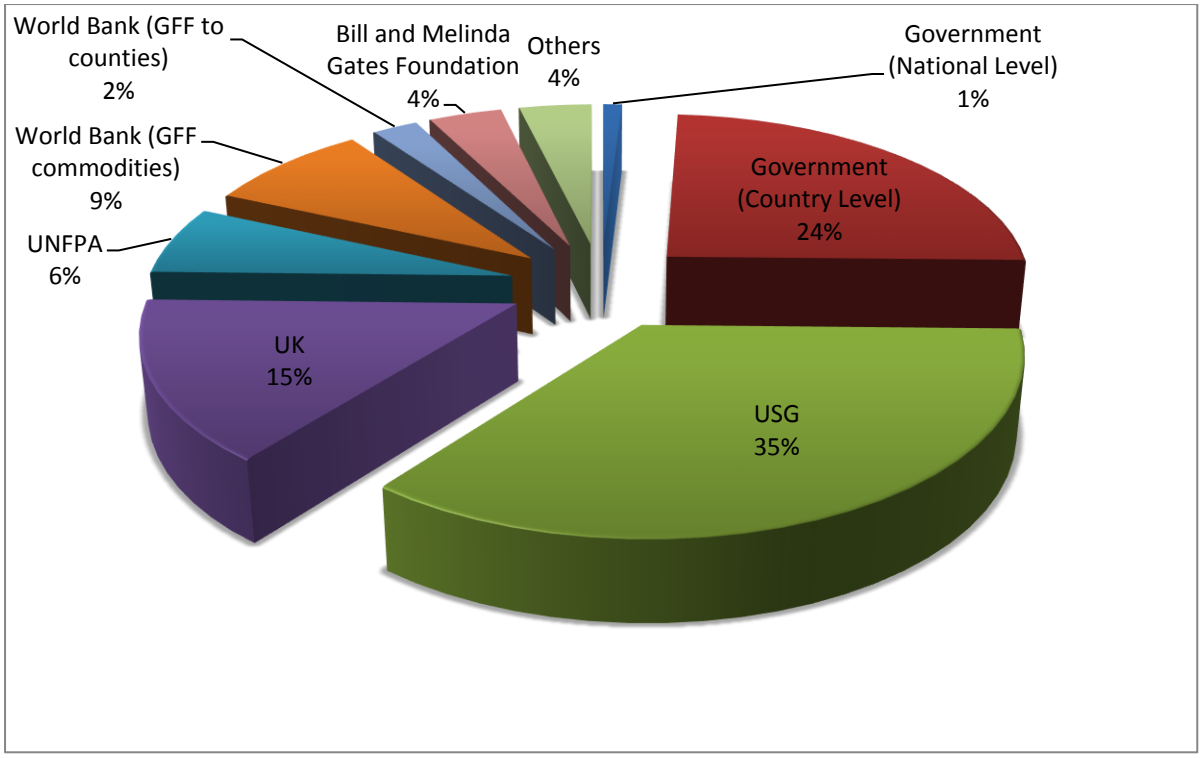



**Figure 1.2 Estimated available resources (2017 to 2020)**
*Source*: Adopted from National CIP 2017 – 2020.

Figure 1.2 reveals that FP financing is projected to remain heavily dependent on development partners. However, Kenya graduated to a lower middle income country (LMIC) together with Bangladesh, Myanmar and Tajikistan with annual incomes of US$ 1,046 to US$ 4,125 (World Bank, 2015). This has the implication of reorientation of development partner priorities from support of commodities and supplies to other program areas such as economic empowerment. This poses a serious risk towards the gains Kenya has achieved on the FP front, calling for efforts to increase domestic financing, through medical/ health insurance among others. The use of medical/ health insurance to finance FP service provision will mitigate the present scenario of a high funding gap estimated to be between Kshs. 1.488 billion (2017) and Kshs. 2.447 billion (2020) as presented in Figure 1.3 below.

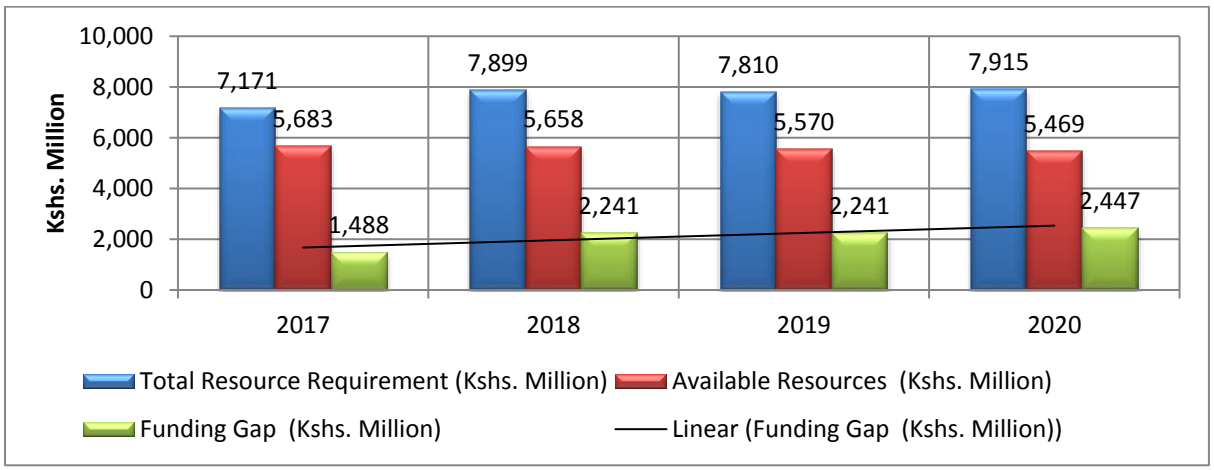



**Figure 1.3 Funding Gap**
*Source*: Adopted from National CIP 2017 – 2020.

There are other benefits on the demand side of increasing access to FP through health/ medical insurance. For example, it leads to a reduction in the financial barrier to access as a result of user charges, eliminating the possibility of unexpected and catastrophic OOP expenses, especially for the poor. There has been renewed effort, in recent years, to expand coverage of the NHIF as part of Kenya's commitment to progressive universalism of health coverage. There is however, limited literature and information available on the roles of public and private health/medical insurance firms on increasing access, utilization and financing of Family Planning services in Kenya. For example, a technical report (UNFPA, Netherlands Interdisciplinary Demographic Institute (NIDI), African Population and Health Research Center (APHRC), 2013) suggests that coverage of health insurance in Kenya is limited both in terms of the numbers covered and the resources controlled by the insurance sector – National Hospital Insurance Fund (NHIF) and Private health Insurance. In 2005/06, private health insurance controlled 9.3% of the total expenditures on RH compared to 12.5% in 2009/10. NHIF controlled 6.2% of total RH resources in 2005/06 as opposed to 8.8% in 2009/10. In total, health insurance accounted for 21.3% of resources mobilized for RH up from 15.5% of resources mobilized for RH in 2005/06.

Global evidence reveals that investing in RMNCAH is a smart buy, since for an additional **US$1** invested in women's and children's health, there would be **US$9** of economic and social benefits (Global Strategy for Women's Children's and Adolescent's Health 2016-2030, UN). It further reveals that investing in women is a smart investment that improves productivity, engenders economic empowerment, closes the gender gap and has an inter-generational impact.

With reduction in births each year, the working- age population grows larger in relation to the young dependent population. This leads to more people in the labour force and fewer young people to support, leading to a decline in the dependency ratios creating a window of opportunity for rapid economic growth. This will therefore present Kenya with the opportunity to produce healthy and competent workforce ready for the labour market and generate sufficient jobs. However, the government, development partners and the private sector have to make the right social and economic investments and policies on Family Planning.

## 1.3 Provision and Cost of Family Planning Services

Provision of Family Planning (FP) services involves the use of resources from both the public and private sectors (Barnum and Kutzin, 1993). Costs incurred while providing FP services are divided into fixed and variable costs. The fixed costs are the part of total costs that do not change with output or do not vary in the short run (Barnum and Kutzin, 1993), for example facility costs. On the other hand, variable costs are the part of total costs that vary with output (commodities). For instance, the cost of commodities varies with the number of clients provided with the same.

Provision of FP services involves the mixture of various inputs such as; clinicians, nurses, commodities, injectables, drugs, and equipment among others. Cost is the value of the inputs used. There are two main ways of estimating costs of resources: financial and economic costing. Financial costs represent actual expenditures on goods and services purchased, that is costs in terms of what is actually paid. In this case the prices and quantities of these resources are known. Economic costs include costs of the forgone alternative, which are commonly referred to as opportunity costs.

Cost- effectiveness analysis (CEA) involves relating costs to single common effect that may differ in magnitude between the alternative interventions, for example cost per Maternal Death Averted or cost per disability adjusted life years (DALY) averted. Cost analysis is a tool that provides useful insight on the functioning of interventions, but it is not an economic evaluation (Walker, 2001). CEA provides a systematic and transparent framework by which to assess the relative costs and consequences of different interventions that can assist in priority setting exercises (Walker, 2001). CEA is used mostly in situations where a decision- maker, operating with a given budget, is considering a limited range of options within a given field. Cost Benefit Analysis (CBA) monetizes both the benefit and the costs.

Several studies have been conducted to establish the Cost Effectiveness of maternal and neonatal health interventions. Table 1.1 summarizes the Cost per DALY of maternal and neonatal health interventions as reported by Disease Control Priorities Project 2[7].

| S.No | Problem | Intervention | Cost per DALY (or other measure reported) |
|---|---|---|---|
| 1 | Unwanted pregnancy | Family planning programs: IUDs, voluntary sterilization, condoms and other barrier methods, implants, and oral contraceptives | 117 |
| 2 | Maternal mortality (1) | Improved overall quality of care: improvements to quality of prenatal and delivery care; enhanced package including availability of doctor and full range of basic and comprehensive emergency obstetric care (all 6 essential obstetric functions: administering antibiotics intravenously or intramuscularly, administering oxytocics IV or IM, manual removal of placenta, administering anticonvulsants IV or IM, instrumental delivery, and removing retained products of conception; optional nutritional supplementation | 147<br><br>(South Asia; range 133-160)<br><br>83 (Sub-Saharan Africa; range 82-85) |
| 3 | Maternal mortality (2) | Improved quality of prenatal and delivery care and coverage; increase in the proportion of women receiving needed care; enhanced package including availability of doctor and full range of basic and comprehensive emergency obstetric care (all 6 essential functions noted above); optional nutritional supplementation | 152 (south Asia; range 138-167)<br>86 (Sub-Saharan Africa; range 85-86) |
| 4 | Neonatal mortality (2) | Family, community, or clinical neonatal package: healthy home care practices, including exclusive breastfeeding, warmth protection, clean cord care, care-seeking for emergencies; if birth outside a facility, then clean delivery kit | 839 (South Asia)<br>789 (Sub-Saharan Africa) |
| 5 | Emergency medical care (1) | Training volunteer paramedics with lay first responders: identification and training of community member first responders and | 6 |

[7] Disease Control Project 3 released 7th August 2017

| | | | |
|---|---|---|---|
| | | paramedics to act in health emergencies, recognize life-threatening situations, transport patients, and provide basic first aid | |
| 6 | Emergency medical care (2) | Staffed community ambulance: training programs for emergency responders and ambulance drivers in urban or rural settings for countries that lack ambulances and training programs | 120 (range 60-179) |
| 7 | Problems requiring surgery | Surgical ward or services in district hospital or community clinic: to provide care for a wide range of conditions such as trauma, childbirth and abdominal conditions | 136 (range 54-217) |

**Table 1: Cost per DALY of Maternal and Neonatal Health Interventions**
Source: Laxminarayan R, Chow J, Shahid-Salles SA, 2006.

## 1.4 Objectives of Cost Effectiveness and Cost Benefit Analysis

The overall objective of the study is to estimate the cost effectiveness and cost benefit analysis of Family Planning in Kenya. This is in a bid to encourage the public and private sector actors to invest in family planning. It may also induce medical/ health insurance providers to include family planning in their benefit package because of the high returns from family planning.

The specific objective of the study is to document the cost benefit analysis of investing in FP by both the public and private sector.

## 2.0 METHODOLOGICAL APPROACH

The methodology involved the following components presented in the following sections.

### 2.1 Costing Family Planning

The costing analysis applied the Costed Implementation Plan (CIP) Costing Tool developed by Health Policy Plus (HPP) that utilizes the activity-based approach to cost FP services. Three data inputs were used: i) population in need of FP services; ii) coverage targets; and iii) unit costs. The unit costs were computed using the ingredients approach. The estimated cost per person or per activity was computed using the following formula:

$$Cost\ per\ activity = Population\ X\ Coverage\ Target\ X\ Unit\ Cost$$

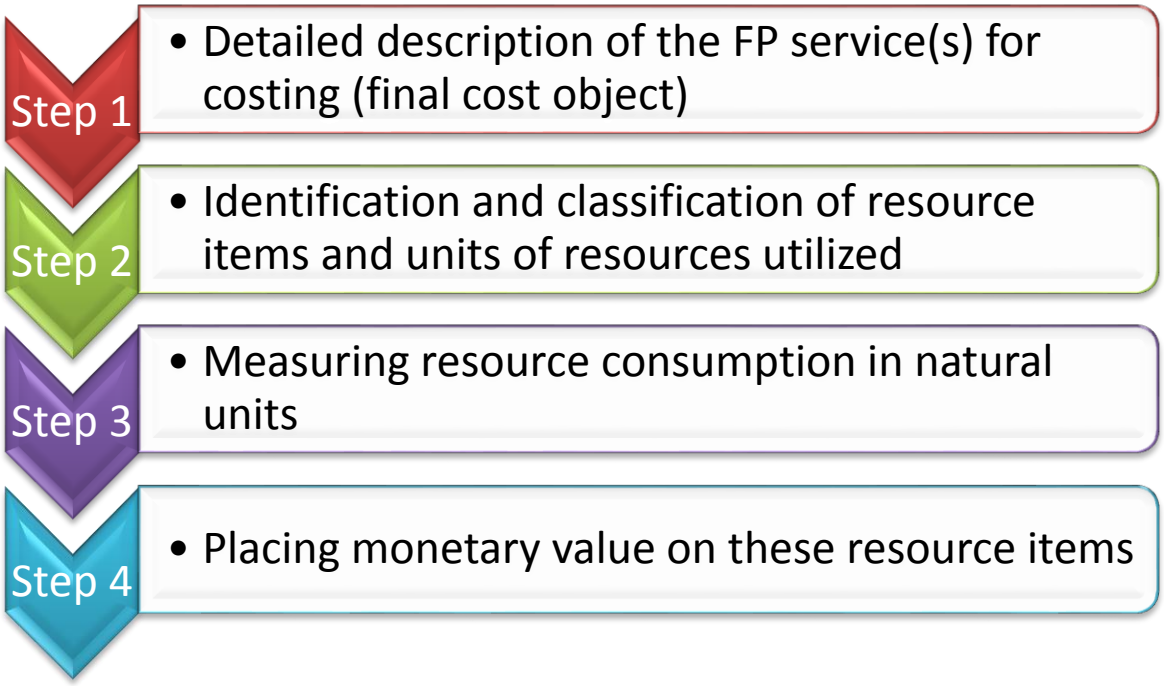
Where

- Population is the number of persons who require the service
- Coverage target is the share of the population the FP programme aims to reach
- Unit cost is the estimated amount of resources required to deliver a service to one person

Annual increases in coverage were obtained from Kenya Reproductive, Maternal, Newborn, Child and Adolescent health (RMNCAH) Investment Framework of 2016.

The costs that were included here were resource costs over the FP's intervention's life. Costs are presented in local currency (Kenya shillings) and further converted to US dollars, using the purchasing power parity (PPP) rate, providing for international comparison. The consumer price index (CPI) was used to deflate each year's costs to a certain base year chosen from the range of costs collected. The base year was chosen from a year with less economic upheavals. Capital inputs used in this study were annualized using a discount rate of 3 percent, which is consistent with the convergence to the long run equilibrium economic growth rate. Besides, depreciation of the equipment used was done using the official rates provided by Government of Kenya. This was done in consideration to the useful life of the equipment to obtain the salvage value.

**Figure 2.1 Steps in Costing Analysis**




## 2.3 Impact of Investment in Family Planning

The impact of investments in Family Planning (FP) was estimated using the ImpactNow model developed by Marie Stopes and Health Policy and Planning. This involved plugging in the targets including coverage. The impact was given in terms of:

i. Unintended Pregnancies Averted
ii. Abortions Averted
iii. Unsafe Abortions Averted
iv. Child Deaths Averted
v. Maternal Deaths Averted
vi. DALYs Averted

### 2.3.1 Cost Effectiveness Analysis

Cost effectiveness analysis (CEA) involves measuring and comparing costs and consequences of various interventions, revealing their relative efficiency. The only difference with cost benefit analysis is that the outcome measure is not expressed in monetary terms.

Costs were obtained as discussed in section 2.2. Cost per DALY Averted was estimated using the results from the **ImpactNow** and the costing from Costed Implementation Plan (CIP) Costing Tool developed by Health Policy Plus (HPP).

### 2.3.2 Cost Benefit Analysis

Cost benefit analysis (CBA) involves measuring and comparing costs and benefits, in money, of various interventions, revealing their relative efficiency. The financial and economic cost benefit indicator gives different information on the intervention. The former shows costs from the budgetary point of view, while the latter shows the impact on the economy in general.

Costs were obtained as discussed in section 2.2 above. Since cost benefit analysis requires that the benefits are monetized, maternal and child deaths averted were converted into productivity gained estimated using the GDP per capita. In addition, life expectancy was used to estimate the number of years that one death averted was deemed productive.

The saved productivity was aggregated for all deaths averted over the productive life expectancy. The benefit cost ratios were computed as:

$$Benefit\ Cost\ Ratio = \frac{Beneifit\ in\ monetary\ terms}{Cost\ of\ Family\ Planning} \qquad 2.1$$

Both costs and benefits were discounted using social discount rates of 3 percent as advised by World Health Organization (WHO) and in line with the convergence to the Longrun equilibrium economic growth rate.

# 3.0 FINDINGS OF THE STUDY

## 3.1 Unit Costs

The unit costs of family planning methods are presented in Table 3.1. They are presented per procedure, insertion, injection, monthly cycle and per piece.

**Table 3.1: Cost of FP commodity and consumables**

| Family Planning Method | Unit cost (KSH) | Unit cost (US$) | |
|---|---|---|---|
| **Male sterilisations** | 1,227 | 12.15 | *per procedure* |
| **Female sterilisations** | 1,227 | 12.15 | *per procedure* |
| **IUDs** | 101 | 1.00 | *per insertion* |
| **Implants** | 1,069 | 10.58 | *per insertion* |
| **Injectables** | 115 | 1.14 | *per injection* |
| **Pills** | 30 | 0.30 | *monthly cycle* |
| **Male condoms** | 3 | 0.03 | *per piece* |
| **Female condoms** | 59 | 0.58 | *per piece* |

*Source*: Adopted from National CIP 2017 – 2020.

These are the unit costs used in the CIP Costing Tool to generate costs for FP commodities in Kenya.

## 3.2 Total Cost of Family Planning Services

The estimated total cost of Family Planning as estimated in the OneHealth Model for the period 2017 – 2020 are presented in Table 3.2.

**Table 3.2: Total annual Cost of Family Planning in Kenya (Kshs, Million)**

| Item | 2017 | 2018 | 2019 | 2020 | Total |
|---|---|---|---|---|---|
| **Commodity Security** | 3,892 | 4,078 | 3,945 | 4,031 | 15,947 |
| **Family Planning Financing and Sustainability** | 38 | 19 | 10 | 9 | 75 |
| **Stewardship, Governance & Partnerships** | 468 | 226 | 227 | 235 | 1,156 |
| **Family Planning Information Management** | 338 | 353 | 283 | 373 | 1,348 |
| **Demand Creation** | 256 | 1,249 | 1,170 | 1,284 | 3,959 |
| **Service Delivery** | 2,179 | 1,974 | 2,175 | 1,983 | 8,312 |
| **Total** | **7,171** | **7,899** | **7,810** | **7,915** | **30,796** |

*Source*: Adopted from National CIP 2017 – 2020.

Table 3.1 shows that the estimated cost of FP is and will be over about KES 7 billion annually. The costs are presented as; KSh 7.17 billion (US$ 71 million) in 2017, KSh 7.90 billion (US$ 78) million in 2018, KSh 7.81billion (US$ 77 million) in 2019 and KSh 7.92 billion (US 78 million) in 2020. The total estimated cost for the entire period of four year is KSh 30.80 billion (US$ 305 million).

## 3.3 Impact of Family Planning

The impact of investment in Family Planning was estimated using the ImpactNow Model. The model was used to generate health impact of Family Planning. The input into the model included the target mCPR for 2017 up to 2010.

**Table 3.3 Impact of Family Planning**

| Indicator | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| Unintended pregnancies averted | 1,902,938 | 1,949,697 | 2,024,513 | 2,105,392 |
| Births averted | 1,037,688 | 1,063,186 | 1,103,983 | 1,148,087 |
| Abortions Averted | 589,911 | 604,406 | 627,599 | 652,671 |
| Unsafe Abortions Averted | 564,900 | 578,781 | 600,990 | 624,999 |
| Maternal deaths averted | 4,955 | 4,856 | 4,813 | 4,767 |
| Child deaths averted | 29,887 | 30,621 | 31,796 | 33,067 |
| DALYs averted | 2,835,651 | 2,891,578 | 2,988,258 | 3,092,789 |
| Unmet Need | 14.60% | 14.20% | 13.80% | 13.40% |

*Source*: Adopted from National CIP 2017 – 2020.

As shown in Table 3.3, unintended pregnancies averted are significant, increasing from 1,902,938 in 2017 to 2,105,392 in 2020. These are the number of pregnancies that occurred at a time when women (and their partners) either did not want additional children or wanted to delay the next birth. They are usually measured with regard to last or recent pregnancies, including current pregnancies. Additionally, over one million births will be averted and over half a million unsafe abortions averted. The improved health outcomes will be realised through reduced mortality, where number of maternal deaths averted will be 4,955 in 2017 and declining to 4,767 in 2020. The number of child deaths averted will be increasing over the period of the FP CIP. The decline in mortality will be attributed to increase coverage of FP services in the country.

## 3.4 Cost Effectiveness Analysis

Cost effectiveness analysis (CEA) involved measuring and comparing costs and DALYs Averted from investing in Family Planning. Costs were obtained as discussed in section 2.2. whereas DALYs Averted were estimated using the results from the ImpactNow Model.

DALYs are the sum of years of life lost (YLLs) and years of life lived with disability (YLDs). The impact of interventions on DALYs (i.e. the DALYs averted by an intervention) is measured by calculating DALYs in two scenarios: with and without the intervention.

The results of the cost effectiveness analysis are presented in Figure 3.1.

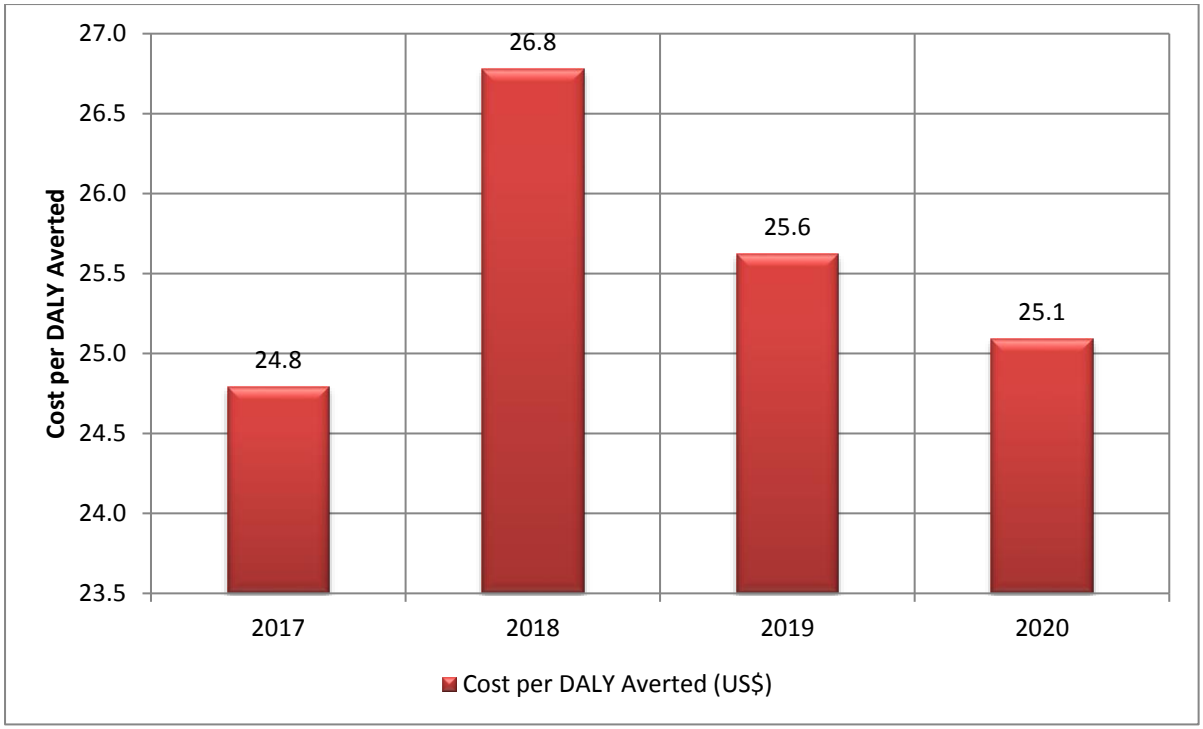



**Figure 3.1 Cost per DALY Averted**

The average cost effectiveness ratio (ACER) is estimated to be **US$ 24.8** for 2017, and it increases to **US$ 26.8** for 2018, decreasing to **US$ 25.6** and **US$ 25.1** in 2019 and 2020 respectively. The implication of the Cost per DALY Averted for 2017 means that a **US$ 24.8** investment in family planning will help avert **one** disability arising from maternal and child deaths (DALYs Averted). This increases to **26.8** Cost per DALY Averted in 2018, and this is mainly because the costs in 2017 were higher attributed to increased demand creation costs of FP. This reveals that in Kenya, Family Planning is highly cost effective, given that the Average cost effectiveness ratios are more than three times lower than the **GDP per Capita US$ 1,455.36**[8].

A review of literature search identified seven studies on cost-effectiveness of contraceptives published since 2000; one additional study was obtained from a supplemental search adding the term "couple-year protection" as an economic term. The literature on cost-effectiveness of family planning is well established, given that lending and aid for family planning has been available since at least the 1970s. Recent studies focus on the cost-effectiveness of extending benefits to under-served countries and on newer family planning methods.

Four studies use cost per life-year saved, examining primarily the benefits to the mother's health from pregnancies averted; the other four use cost per CYP. The four studies focusing on mother's health (Afghanistan, India, and two from Nigeria; see Horton, Wu, and Brouwer

[8] Thresholds for the cost–effectiveness of interventions: alternative approaches (http://www.who.int/bulletin/volumes/93/2/14-138206/en/)

2015) conclude that modern contraceptives are very cost-effective in that cost per life-year saved was less than per capita gross domestic product (GDP).

### 3.5 Cost Benefit Analysis

Cost benefit analysis (CBA) involved measuring and comparing costs and benefits of various interventions, revealing their relative efficiency. Since cost benefit analysis requires that the benefits are monetized, maternal and child deaths averted were converted into productivity losses in terms of GDP per capita. In addition, life expectancy was used to estimate the number of years that one death averted was deemed productive.

The saved productivity was aggregated for all deaths averted over the productive life expectancy. The benefit cost ratios were computed as:

$$Benefit\ Cost\ Ratio = \frac{Saved\ Productivity}{Cost\ of\ Family\ Planning} \qquad 3.1$$

On the basis of the explanations above, the monetization of the saved productivity is presented in Tables 3.4 and 3.5 below.

**Table 3.4 Monetary Benefit of Saved Productivity (Children)**

| Year | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| **Under five lives saved from RMNCAH investment** | 29,887 | 30,621 | 31,796 | 33,067 |
| **Present value of productive life-years per child under-five** | 13.7523175 | 13.3517646 | 12.9628782 | 12.5853187 |
| **Total Productive Life Years for the Children** | 411,015.51 | 408,844.38 | 412,167.68 | 416,158.73 |
| **Value in US$ Billion** | 52.2402772 | 51.9643254 | 52.3867177 | 52.8939829 |

**Source: Author's Calculation**

**Table 3.5 Monetary Benefit of Saved Productivity (Mothers)**

| Year | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| **Mothers lives saved from RMNCAH investment** | 4,955 | 4,856 | 4,813 | 4,767 |
| **Present value of productive life-years per mother** | 21.7657918 | 21.142818 | 20.5489705 | 19.9834008 |
| **Total Productive Life Years for the Mothers** | 107849.498 | 102669.524 | 98902.1949 | 95260.8717 |
| **Value in US$ Billion** | 13.7077252 | 13.0493479 | 12.5705184 | 12.1077044 |

**Source: Author's Calculation**

Both costs and benefits were discounted using social discount rates of 3 percent as advised by World Health Organization (WHO).

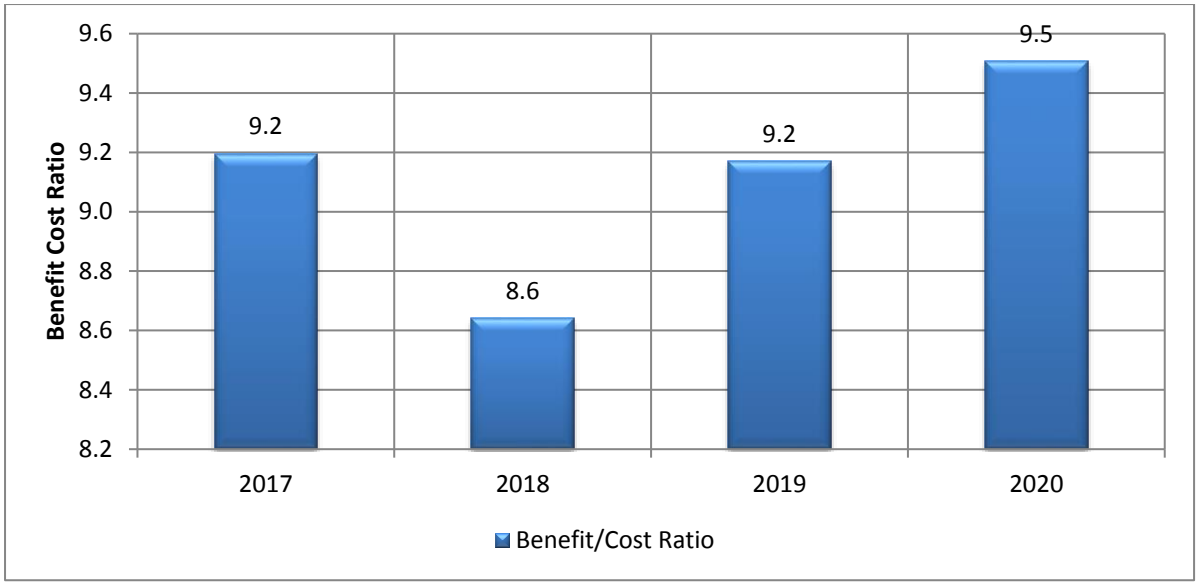



**Figure 3.2 Benefit Cost Ratio of Family Planning Investment**

The Benefit Cost Ratio (BCR) is estimated to be **US$ 9.2** for 2017, and it decreases to **US$ 8.6** in 2018, increasing to **US$ 9.2** and **US$ 9.5** in 2019 and 2020 respectively. The implication of the estimated Benefit Cost Ratio that is greater than one (BCR>1) implies that investment in FP will yield discounted benefits that are greater than discounted costs, and therefore the investment should go ahead. The returns from investing in FP are very high since for 2017, a **US$ 1** investment in FP yields **US$9.2** in benefits. This resonates well with the earlier findings from the Global evidence which revealed that investing in RMNCAH is a smart buy, since for an additional **US$1** invested in women's and children's health, there would be **US$9** of economic and social benefits (Global Strategy for Women's Children's and Adolescent's Health 2016-2030, UN).

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

This study sought to assess the cost effectiveness and cost benefit of Family Planning in Kenya. Family planning (FP) is a central pillar of Kenya's reproductive health (RH) programme and the wider national health priorities as outlined in the Kenya Health Sector Strategic & Investment Plan (KHSSP) 2013-17, Kenya Vision 2030 and Kenya Health Sector Policy. The central role of FP is also emphasized in Sessional Paper No. 3 of 2012 on Population Policy for National Development.

The study establishes that FP is highly cost effective, given that the Average cost effectiveness ratios are much lower than the GDP per Capita US$ 1,455.36. It further establishes that the Benefit Cost Ratio that is greater than one (BCR>1), which implies that investment in FP will yield discounted benefits that are greater than discounted costs, and therefore the investment should go ahead.

The findings of the study point at the need to encourage actors in both public and private sectors to provide FP services since the economic returns are positive (CBA and CEA). Arising from these findings, the following should be done:

v. Establishment of an engagement framework, including a convening platform, which allows for cross-sector discussion and collaboration to inform expansion of FP initiatives within the private for-profit sector
vi. Establish or modify regulations and guidelines, as necessary to facilitate high quality private sector FP service provision
vii. Address affordability of FP services in the private for-profit sector by standardising the service and exploring innovative approaches that will reduce OOP expenditures, such as using medical/ health insurance.
viii. Identify high-need areas that is prime for private sector expansion, so that public resources can be dedicated towards geographical areas/ population segments that are more in need/ do not have the ability to pay

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## ANNEX 1: DATA

**Table A1: mCPR method mix**

| Contraceptive Method | Method mix | | | | |
|---|---|---|---|---|---|
| | 2016 (baseline) | 2017 | 2018 | 2019 | 2020 |
| **Male sterilisations** | 0.02% | 0.03% | 0.05% | 0.06% | 0.07% |
| **Female sterilisations** | 2.03% | 1.26% | 0.47% | 0.38% | 0.23% |
| **IUDs** | 4.72% | 5.31% | 5.92% | 6.46% | 7.00% |
| **Implants** | 12.32% | 13.33% | 14.36% | 15.25% | 16.13% |
| **Injectables** | 25.43% | 24.35% | 23.26% | 21.83% | 20.44% |
| **Pills** | 9.25% | 9.72% | 10.18% | 10.54% | 10.90% |
| **Male condoms** | 2.61% | 2.78% | 2.94% | 3.06% | 3.19% |
| **Female condoms** | 0.01% | 0.02% | 0.02% | 0.03% | 0.03% |
| **Total** | 56.4% | 56.8% | 57.2% | 57.6% | 58.0% |

*Source*: Adopted from National CIP 2017 – 2020.

## ANNEX 2: PRIORITY ACTION AREAS FOR FAMILY PLANNING

***Seven strategic priority action areas***

**Priority # 1:** Improve FP commodity procurement and distribution and ensure full financing of FP commodities in the public and private sectors to prevent stock-outs

**Priority # 2:** Increase the sustainability of FP commodities and services through government commitment, integration of the private sector, and diversification of funding sources

**Priority # 3:** Strengthen FP leadership at national and county levels; integrate FP policy, information, and services across sectors for holistic contribution to social and economic transformation

**Priority #4:** Strengthen evidence base for effective programme implementation through research and information dissemination to enhance relevant programming

**Priority #5:** Improve ability of individuals within the population as a whole, and special needs groups to achieve their fertility desires by providing tailored FP services, and information on SRH and linkage between fertility and general health and well-being

**Priority # 6:** Promote and nurture change in social and individual behaviour to address myths and misconceptions and improve acceptance and continued use of FP with a special focus on increasing age-appropriate information, access, and use of FP amongst young people, ages 10-24 years and populations living in ASAL areas

**Priority #7:** Enhance skills of new and existing health care workers through adequate practical training in the full FP method mix, and empower community health workers to provide counselling and referral services, and short-term methodS

*Source*: Adopted from National CIP 2017 – 2020.

## ANNEX 3: COSTS OF FAMILY PLANNING BY COUNTY

| County | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| Baringo | 55,559,093 | 58,509,150 | 58,564,402 | 60,935,463 |
| Bomet | 105,999,527 | 110,749,451 | 109,954,024 | 113,227,989 |
| Bungoma | 247,950,946 | 258,755,916 | 256,623,625 | 262,888,881 |
| Busia | 140,555,425 | 146,526,550 | 145,213,842 | 148,114,379 |
| Elgeyo Marakwet | 57,322,897 | 59,819,940 | 59,532,497 | 61,772,912 |
| Embu | 138,781,078 | 144,091,561 | 142,458,267 | 142,385,056 |
| Garissa | 13,097,410 | 14,998,469 | 16,151,157 | 12,829,380 |
| Homa Bay | 152,899,256 | 160,235,749 | 159,356,957 | 165,078,635 |
| Isiolo | 13,584,891 | 14,321,303 | 14,414,250 | 14,852,809 |
| Kajiado | 106,824,679 | 111,813,231 | 111,215,607 | 115,251,711 |
| Kakamega | 340,617,458 | 354,342,592 | 350,836,912 | 355,425,181 |
| Kericho | 147,930,180 | 154,316,642 | 152,919,828 | 155,878,647 |
| Kiambu | 395,160,062 | 410,635,291 | 405,944,389 | 405,342,813 |
| Kilifi | 122,936,767 | 129,313,782 | 129,470,139 | 134,678,780 |
| Kirinyaga | 138,262,362 | 143,926,208 | 142,091,873 | 139,511,888 |
| Kisii | 228,411,760 | 237,819,639 | 235,341,947 | 237,361,110 |
| Kisumu | 185,901,659 | 193,365,541 | 191,495,116 | 194,334,618 |
| Kitui | 158,883,220 | 165,448,476 | 164,030,845 | 167,717,245 |
| Kwale | 81,777,761 | 85,762,587 | 85,580,397 | 89,109,141 |
| Laikipia | 72,199,008 | 75,434,217 | 74,872,663 | 77,011,713 |
| Lamu | 13,531,540 | 14,157,813 | 14,114,667 | 14,686,531 |
| Machakos | 239,344,608 | 248,776,936 | 245,944,066 | 245,677,947 |
| Makueni | 153,874,503 | 160,245,857 | 158,502,523 | 159,171,008 |
| Mandera | 2,390,691 | 2,978,301 | 3,422,982 | 1,254,491 |
| Marsabit | 11,901,460 | 13,114,604 | 13,654,158 | 12,000,815 |
| Meru | 335,936,902 | 349,074,053 | 344,761,444 | 340,358,955 |
| Migori | 143,008,550 | 149,572,334 | 148,853,927 | 154,456,519 |
| Mombasa | 151,662,579 | 158,628,762 | 157,887,064 | 163,874,345 |
| Murang'a | 187,867,146 | 195,105,175 | 193,048,653 | 194,489,118 |
| Nairobi | 745,374,293 | 776,887,204 | 769,589,262 | 782,620,081 |
| Nakuru | 312,090,637 | 325,632,650 | 322,982,621 | 331,054,630 |
| Nandi | 149,671,051 | 155,984,039 | 154,486,174 | 156,860,570 |
| Narok | 104,994,645 | 110,429,688 | 110,200,171 | 114,746,594 |
| Nyamira | 110,125,947 | 114,402,489 | 113,171,441 | 113,780,040 |
| Nyandarua | 121,392,153 | 126,266,088 | 125,014,132 | 126,626,951 |

| | | | | |
|---|---|---|---|---|
| Nyeri | 153,548,358 | 159,455,409 | 157,655,578 | 157,655,875 |
| Samburu | 14,755,463 | 15,879,215 | 16,105,687 | 16,187,810 |
| Siaya | 132,263,529 | 138,130,336 | 137,107,714 | 141,051,323 |
| Taita Taveta | 57,573,146 | 59,884,404 | 59,279,779 | 59,955,251 |
| Tana River | 18,173,940 | 19,466,224 | 19,754,672 | 19,813,146 |
| Tharaka-Nithi | 82,778,272 | 85,697,368 | 84,723,379 | 84,651,861 |
| Trans-Nzoia | 162,669,577 | 169,749,352 | 168,232,304 | 171,617,107 |
| Turkana | 41,940,871 | 46,236,358 | 48,201,870 | 42,023,620 |
| Uasin Gishu | 176,734,429 | 184,466,727 | 182,835,118 | 186,624,365 |
| Vihiga | 98,885,571 | 102,900,295 | 101,976,236 | 103,998,606 |
| Wajir | 9,318,118 | 11,287,812 | 12,676,832 | 6,572,739 |
| West Pokot | 25,904,656 | 28,263,607 | 29,129,483 | 27,148,087 |
| **Total** | **6,662,368,074** | **6,952,859,393** | **6,899,380,673** | **6,982,666,733** |

*Source*: Adopted from National CIP 2017 – 2020

## ANNEX 4: mCPR METHOD MIX

***Contraceptive Method*** **Method mix**

| | 2016 (baseline) | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| *Male sterilisations* | 0.02% | 0.03% | 0.05% | 0.06% | 0.07% |
| *Female sterilisations* | 2.03% | 1.26% | 0.47% | 0.38% | 0.23% |
| *IUDs* | 4.72% | 5.31% | 5.92% | 6.46% | 7.00% |
| *Implants* | 12.32% | 13.33% | 14.36% | 15.25% | 16.13% |
| *Injectables* | 25.43% | 24.35% | 23.26% | 21.83% | 20.44% |
| *Pills* | 9.25% | 9.72% | 10.18% | 10.54% | 10.90% |
| *Male condoms* | 2.61% | 2.78% | 2.94% | 3.06% | 3.19% |
| *Female condoms* | 0.01% | 0.02% | 0.02% | 0.03% | 0.03% |
| *Total* | 56.4% | 56.8% | 57.2% | 57.6% | 58.0% |

*Source*: Adopted from National CIP 2017 – 2020